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Applicants: Beck, Thomas William et al.
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Examiner: Shabman, Mark A.
Art Unit: 2856

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8(a)

The undersigned hereby certifies that this document is being electronically filed in accordance with § 1.6(a)(4), on the 21st day of May, 2008.



Gregory Gerstenzang, Reg. No. 59,513

Commissioner for Patents

Declaration of Warren Thomas Johnson Under 37 CFR 1.132

Sir:

I, Warren Thomas Johnson, of 87 Avoca Road, Grose Wold, New South Wales 2753, Australia hereby declare:

- 1) I graduated from The University of New South Wales in 1985 with a Bachelor of Engineering Degree in Chemical Engineering (Hons 1).
- 2) I have 22 years of experience in the field of filtration technology, and especially membrane filtration technology. I am a named inventor on several patents related to membrane filtration technology, including, for example, U.S. Patent Nos. 6,077,435, 6,156,200, 6,159,373, 6,202,475, and 6,555,005.
- 3) I am Global Director, R&D, for MEMCOR® Products, 1 Memtec Parkway, South Windsor, New South Wales 2756, Australia, which is part of Siemens Water Technologies Corp. (SWT) I have held this position for 20 months. As Global Director, R&D, I am responsible for managing the development and testing of new products, processes, plant and equipment to support

the global SWT Memcor membrane business. Thus, I am familiar with the field of membrane filtration devices, their applications, their manufacture and the various limitations associated with particular designs and materials of construction.

4) I am a co-inventor in the present application, which is assigned to USFilter Wastewater Group, Inc., which is part of Siemens Water Technologies Corp.

5) I am familiar with the prosecution history of this patent application. I have read and understood the arguments previously presented during the prosecution of the present application. I agree with those arguments.

6) I understand that in the examination of this application, claim 12 is rejected as being anticipated by the disclosure of Bartels et al. in U.S. Patent Pub. No. 2003/0150807 A1 (hereinafter "Bartels"), and that claims 2-11 are rejected as being obvious over the disclosure of Selbie et al. in U.S. Patent No. 6,202,475 B1 (hereinafter "Selbie"), in view of the disclosure of Bartels.

7) I have read and understand each of Selbie and Bartels. Bartels is directed to a method of "improving performance of a filtration membrane module comprising a plurality of microporous hollow fibers, the method comprising subjecting the fibers to gas-assisted backwashing, wherein the gas-assisted back-washing removes fouling components from the fibers." (Bartels at paragraph 0029.) In the filtration module disclosed in Bartels, feed liquid is introduced to the lumen side of fiber membranes. Filtrate is directed through the membranes and collected into a hollow pipe for removal from the module. (Bartels at FIG. 1 and paragraph 0038.) In the gas-assisted backwashing disclosed in Bartels, gas is applied to the membrane lumens, which is the feed side of the membrane. (Bartels at paragraph 0047.)

8) I am a named inventor of Selbie, U.S. Patent No. 6,202,475 B1, which is assigned to Siemens Water Technologies Corp. Selbie is directed to a method of predicting logarithmic reduction values in filtration systems and the use of such values for the control and monitoring of operating filtration systems. (Selbie at Col. 1, lines 6-9). Selbie discloses a method of testing

the integrity of a porous membrane wherein the lumen side of the membrane is the filtrate side. (Selbie at Col. 2, lines 24-29 and at Col. 3, lines 8-16).

9) In my opinion, at the time of invention of the present invention, one skilled in the art of membrane filtration technology would not have been motivated to combine the membrane integrity testing method disclosed in Selbie with the gas assisted backwashing method disclosed in Bartels. This is because one skilled in the art of membrane filtration technology at the time of invention of the present invention would have believed that such a combination would have reduced the production rate of the membrane filtration system. The mandated frequency of membrane integrity testing varies from about once per day to about once every four hours, depending regional or municipal regulations. Membrane integrity test would typically require on the order of 5-10 minutes to complete. While the membrane integrity test was being performed, the membrane filtration module would not have been able to be utilized for production. Thus, a membrane filtration module experiences production downtime when membrane integrity testing is performed. A membrane filtration module also experience downtime when a backwashing procedure is performed. Backwashing is almost invariable performed more often than membrane integrity testing, in some cases, once every half hour. Thus, if a membrane integrity test as described by Selbie were performed in conjunction with a backwash procedure, this would have increased the total amount of downtime and reduced the amount of time available for production. This would reduce the system production capacity, a result one skilled in the art of membrane filtration technology and operations would have sought to avoid.

10) In my opinion, at the time of invention of the present invention, one skilled in the art of membrane filtration technology would have appreciated that there had been a long felt, but unsolved need, for conducting more frequent integrity tests without a significant impact on downtime. Combining a backwash process with a membrane integrity test is new way of achieving this objective. One skilled in the art of membrane filtration technology would have recognized that cleaning of membranes of membrane filtration modules is useful for maintaining the productivity of filtration modules. Cleaning of membranes often involves a backwashing step. One skilled in the art of membrane filtration technology would also have realized at the time of invention of the present invention that membrane integrity testing is useful for maintaining the quality of filtrate produced by membrane filtration modules and that membrane

integrity testing is required to be performed at not less than a mandated frequency. Thus, one skilled in the art of membrane filtration technology would have realized that both backwashing and membrane integrity testing were both desirable operations to perform in order to maintain productivity and quality of membrane filtration operations. However, to my knowledge, prior to the time of invention of the present invention, no one had found a way to combine these two operations.

11) I conclude that although one skilled in the art of membrane filtration, at the time of invention of the present invention, may have desired to perform membrane integrity testing more frequently, he would not have been motivated to combine a membrane integrity test with a method of membrane backwashing because he would not have contemplated that this could have been accomplished without reducing the productivity of the membrane filtration operation.

12) As noted above, Bartels discloses a method of backwashing hollow fibres involving pressurizing the feed side (the lumen) with air to cause an expansion of the lumen to dislodge solids (Bartels at paragraph [0030]). In the present invention the permeate backwash is achieved by applying the air pressure to the permeate, in the reverse direction to the feed flow, which in the case of Bartels would be on the outside of the hollow fibre rather than the lumen. In my opinion, if one of ordinary skill in the art were to have attempted to combine the disclosure of Selbie with that of Bartels, the resulting process would not have provided a permeate backwash, and would thus not achieve the result obtained by the present invention.

13) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


Warren Thomas Johnson

2nd May 2008
Date